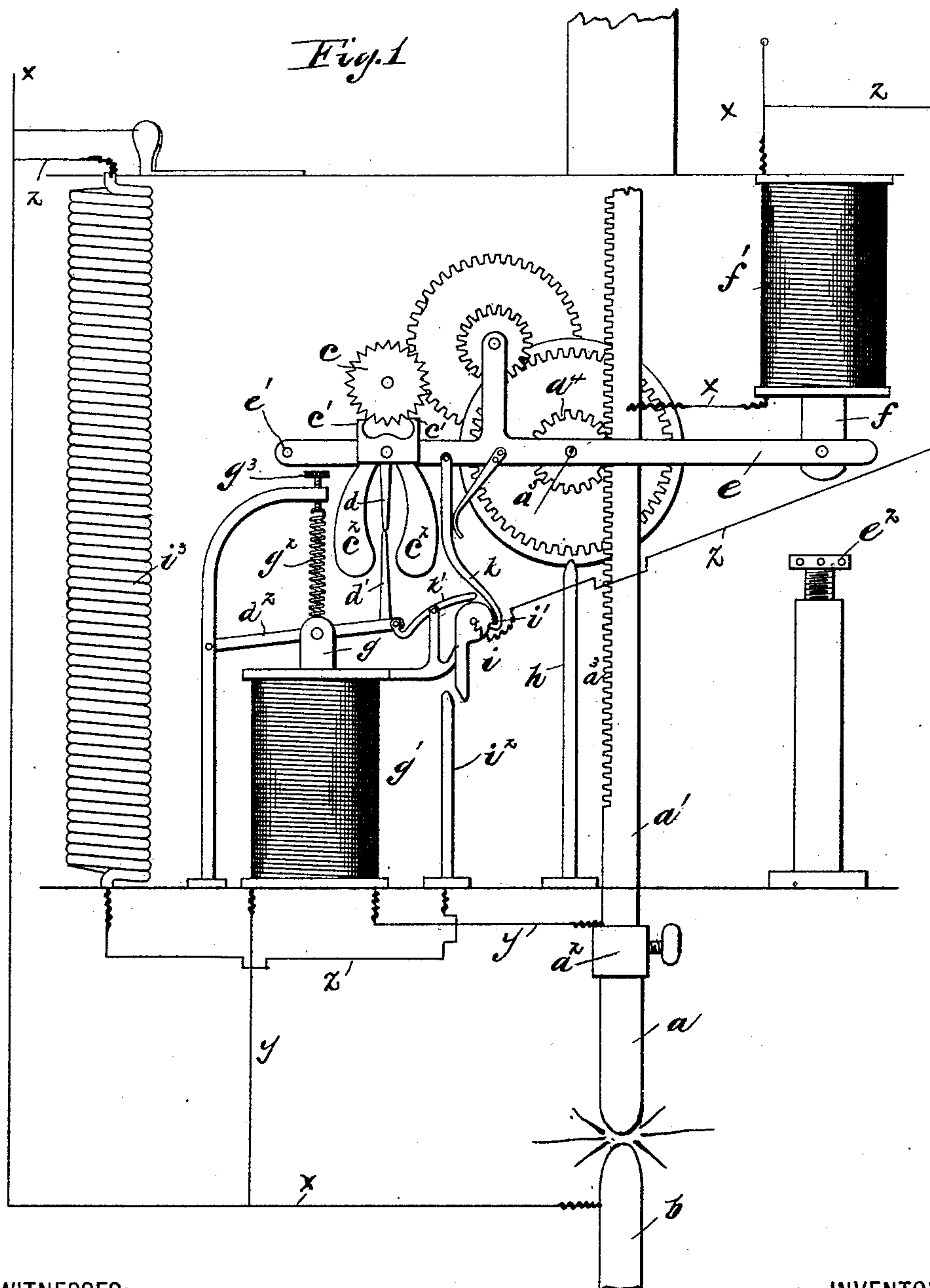


E. F. GWYNN.  
ELECTRIC ARC LAMP.

No. 522,790.

Patented July 10, 1894.



WITNESSES:

*J. C. B. Bradshaw*

*Frank Vatt*

INVENTOR

*Edward F. Gwynn*

BY

*Shepherd*

ATTORNEYS



D'— denotes the detent by which the minute-wheel —C— is held at rest during the operation of printing. Said detent is of the form of a pawl adapted to enter into the notches of the wheel —D— and supported on a shaft —v— pivoted to suitable supports secured to the case —A—. A spring-arm —v'— is connected by a rod —v''— to the crank —e'''— of the rock-shaft —e— and thus the detent is thrown into engagement with the wheel —D— simultaneously with the lifting of the impression roller —R— to imprint the paper mounted thereon.

The front-plate of the case —A— is provided with an annular row of sockets —r—r— arranged concentric to the shaft —a'''—, and from the free end of the lever —I— projects a pin —I'— adapted to enter said sockets. These sockets are numbered consecutively, and each person who is required to use the recorder must adopt one of said numbers to identify said person from all others using the same recorder.

In recording the time of entering or leaving the place of business each employé must turn the lever —I— so as to bring the pin —I'— opposite the number by which said employé is identified. Then by pushing the lever toward the case —A— the plunger —g— is actuated to arrest the movement of the minute-wheel —C— and lift the impression roller —R— to print the time upon the paper mounted on said roller. Said paper is so arranged on the roller as to bring directly under the printing wheel —C— that number marked on the paper which corresponds to the number of the socket —r— which is entered by the pin —I'— in the operation of the lever —I—.

In order to allow the recordings during different periods of the day to be made distinctly on the band of paper, I make the latter and its carrying roller —R— of sufficient width to allow the different times of recording to be printed in rows opposite the respective numbers marked on the paper, and to allow the roller to be shifted laterally and thus permit the printing to be done at different points in the width of the paper I mount said roller loosely on its shaft —a'''— and connect it thereto by a spline in the hub of the wheel entering a longitudinal groove —s— in the shaft.

A horizontal shaft —J— pivoted so the interior of the case and protruding at the front thereof has affixed to its outer end a handle —J'— by which to turn it, and a dial on the front of the case and concentric to the shaft —J— is marked to indicate the position of the handle required for adjusting the roller —R— laterally as aforesaid. To the shaft —J— is fastened a gear-wheel —j— which meshes with a pinion  $k''$  on the worm-shaft —j'— parallel with the shaft —J— and on this worm shaft is mounted a collar —j''— which engages the spiral groove of the worm and is thus caused to move longitudinally when the worm is rotated. An arm —k— ex-

tending from said collar has affixed to it a laterally projecting tongue —k'— which engages a circumferential groove in the hub —k'''— of the roller —R— and therefore compels said roller to move laterally when the worm-shaft is rotated.

The hour-wheel —C'— has the numbers from 1 to 12 projecting from its periphery and receives one-twelfth of a revolution at the end of each complete revolution of the minute-wheel —C—. This may be effected by mechanism similar to that shown in my prior application for patent, Serial No. 451,602, filed November 11, 1892, and it consists of the lever —p— pivoted at the central portion of its length to a yoke —Y— attached to the frame of the machine. Said lever has one end engaging a ratchet wheel —X— fixed to the shaft of the hour wheel. The opposite end of said lever lies on an annular flange on the side of the minute-wheel, which flange has a notch —x— which allows the lever to rock and thereby release the ratchet wheel. A lug —x'— on the minute-wheel then enters between two of the teeth of the ratchet-wheel and causes the same to turn one-twelfth part of a revolution. There are twelve teeth on the said ratchet, hence twelve revolutions of the minute wheel imparts one complete revolution to the hour wheel.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the time-printing wheel and a revoluble impression roller, a lever turning said roller, a rock-shaft moving said roller toward the printing wheel, and a plunger operated by the lever and actuating said rock-shaft, as set forth.

2. In combination with the time-printing wheel, a horizontal crank shaft, props mounted on the cranks of said shaft, a shaft mounted on said props, the impression roller mounted on the latter shaft, a rock-shaft transmitting motion to the aforesaid crank-shaft, a lever turning the shaft of the aforesaid roller, and a plunger actuated by said lever and imparting motion to the rock-shaft, as set forth.

3. In combination with the time printing wheel, a horizontal shaft mounted on vertically movable supports, an impression roller mounted on said shaft, a second horizontal shaft disposed end to end with the first shaft, disks on the adjacent ends of said shaft, lugs on the adjacent faces of the disks and disposed on one disk in a line at right angles to that of the lugs on the other disk, and a disk interposed between the aforesaid disks and provided with slots at right angles to each other and receiving the aforesaid lugs in the manner set forth.

4. In combination with the printing wheel, the shaft —a'''— mounted on vertically movable supports, the impression roller —R— mounted on said shaft, the hollow shaft —a''''—, disks 1 and 3 on the said shafts provided with lugs —d—d—, the intervening



# UNITED STATES PATENT OFFICE.

EDWARD F. GWYNN, OF DELAWARE, OHIO.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 522,790, dated July 10, 1894.

Application filed April 28, 1893. Serial No. 472,188. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD F. GWYNN, a citizen of the United States, residing at Delaware, in the county of Delaware and State of Ohio, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My invention relates to improvements in electric arc lamps; and the object of my invention is to provide a novel device for feeding the carbon, by means of which a regular and steady light may be obtained; the especial object of the invention being to provide means by which the carbon is regularly and uniformly fed under the ordinary conditions of burning; means being provided by which the carbon may be instantaneously or rapidly fed to establish the arc in the event that the current should momentarily cease from the flashing of the dynamo or from other causes.

A further object of my invention is to provide novel means for automatically short circuiting or cutting out the lamp in the event that the current should become interrupted through the ordinary channel from unusual causes connected with the lamp itself.

I attain these objects by the constructions shown in the accompanying drawings, in which—

Figure 1 is a side elevation view of devices embodying my invention; the devices being illustrated more in the nature of a diagram than as a completed lamp. Fig. 2 is a side elevation of a portion of the same. Figs. 3 and 4 are details hereinafter referred to.

Like parts are represented by similar letters of reference in the several views.

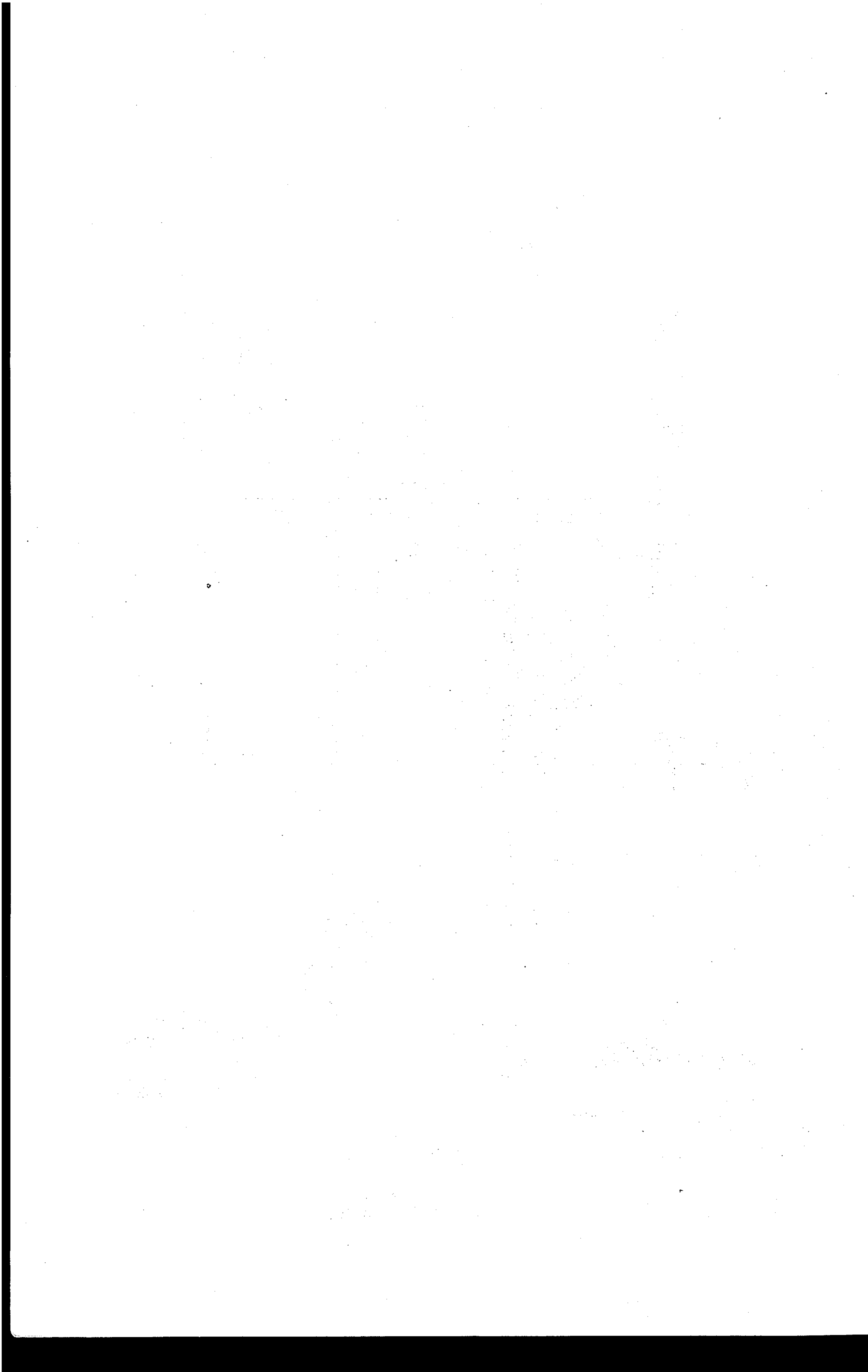
In the accompanying drawings  $a$  and  $b$  represent the carbons, between which the arc is formed. The upper carbon is supported by a carbon rod  $a'$ , to which it is connected by a suitable clamp  $a^2$ , in the usual manner. This carbon rod is provided with a series of teeth  $a^3$ , in the nature of a rack, adapted to be engaged by a pinion  $a^4$ , mounted on a shaft  $a^5$ , which is adapted to be revolved by a train of gears similar to the gearing of an ordinary clock, and controlled by an ordinary clock escapement, consisting of the escapement wheel  $c$ , pallets  $c'$ , connected to a suitable pendulum or weight  $c^2$ . All the gearing thus described is supported on a frame or lever  $e$ , which is

pivoted at  $e'$ , to any suitable portion of the outer frame or supports of the lamps. This pivoted supporting lever or frame  $e$ , is connected at its opposite end to the armature  $f$ , of a solenoid  $f'$ , which is arranged in the main circuit of the lamp.

Located below the lever or frame  $e$ , preferably below the armature  $f$ , of the solenoid  $f'$ , is an adjustable stop  $e^2$ , with which the supporting frame or lever  $e$ , is adapted to contact, when the lamp is in the normal position, without current, and in which position the carbons  $a$  and  $b$ , rest in contact with each other. When the current is turned onto the lamp the solenoid  $f'$ , acts on the armature  $f$ , and raises the lever  $e$ , to the position shown in Fig. 1 and with it the gearing supported thereon, together with the carbon rod  $a'$ , and the carbon  $a$ , sustained by said gearing. The pendulum or verge which supports the pallets  $c'$ , is provided with a downwardly projecting spur  $d$ , adapted to contact with a similar upwardly projecting spur  $d'$ , on a pivoted lever  $d^2$ , pivotally connected to the armature  $g$ , of a solenoid  $g'$ , arranged in the shunt of the arc; a spring  $g^2$ , being adapted to act against the force of said solenoid to raise the lever  $d^2$ , and bring the spurs  $d$ ,  $d'$ , in contact; a suitable adjusting screw  $g^3$ , being provided to vary the tension of the spring  $g^2$ , as desired.

In the normal position the spurs  $d$ ,  $d'$ , are in contact, which prevents a movement of the escapement and thus of the gearing. In the event that the arc becomes too great the current is deflected through the solenoid  $g'$ , which, attracting the armature  $g$ , draws down the lever  $d^2$ , and with it the spur  $d'$ , thus freeing the pendulum or verge which is actuated by the weight of the carbon and carbon rod, and thus permits the upper carbon to feed gradually until the proper resistance at the arc is established, in which case the spring  $g^2$ , returns the parts to their normal position so as to engage the pendulum and stop the operation of the gears.

The description thus far applies to the normal working of the lamp and the feeding of the carbon. It sometimes happens, however, that the current momentarily ceases and the arc is broken. In this case the lever  $e$ , drops down to the adjustable stop  $e^2$ , and in the event that the carbons do not meet, the arc



described, for disengaging said switch by the excessive movement of said solenoid in the shunt of the arc, substantially as specified.

4. The combination with the pivoted lever,  
5 a train of gearing supported thereby, carbon rod connected to said gearing, an escapement for said gearing, the solenoid in the shunt of the arc for controlling said escapement, a magnet in the main circuit for operating said  
10 pivoted frame, a switch actuated by said pivoted frame, and means connected with the

solenoid in the shunt of the arc adapted to disconnect said switch from said lever or frame, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 24th day of April, A. D. 1893.

EDWARD F. GWYNN.

Witnesses:

J. A. BRADSHAW,  
A. J. WILLEY.